

AMENDMENTS TO THE CLAIMS:

Kindly replace the previous claim set with the claim set which appears below, in which Claims 3, 5, 13-15, 21, 23-27, 29-33 and 35-38 have been cancelled and Claims 1-2, 9, 17-18 and 22 have been amended to read as follows:

1. (Currently Amended) A curable composition, comprising:
 - (a) an epoxy or episulfide resin component;
 - (b) a free radical polymerizable component; and
 - (c) a cross linking component, wherein the cross linking component comprises a compound
 - (i) reactive with each of the epoxy resin component and the free radical polymerizable component, or
 - (ii) functionalized with
 - a. at least one group reactive with the epoxy or episulfide resin component and at least one group reactive with the free radical polymerizable component, or
 - b. at least one group reactive through an anionic or cationic mechanism with the epoxy or episulfide resin component and at least one group reactive through a free radical mechanism with the free radical polymerizable component.

2. (Currently Amended) The composition of Claim 1, further comprising a free radical initiator for the free radical polymerizable component, a curative for the epoxy or episulfide resin component, and combinations thereof.

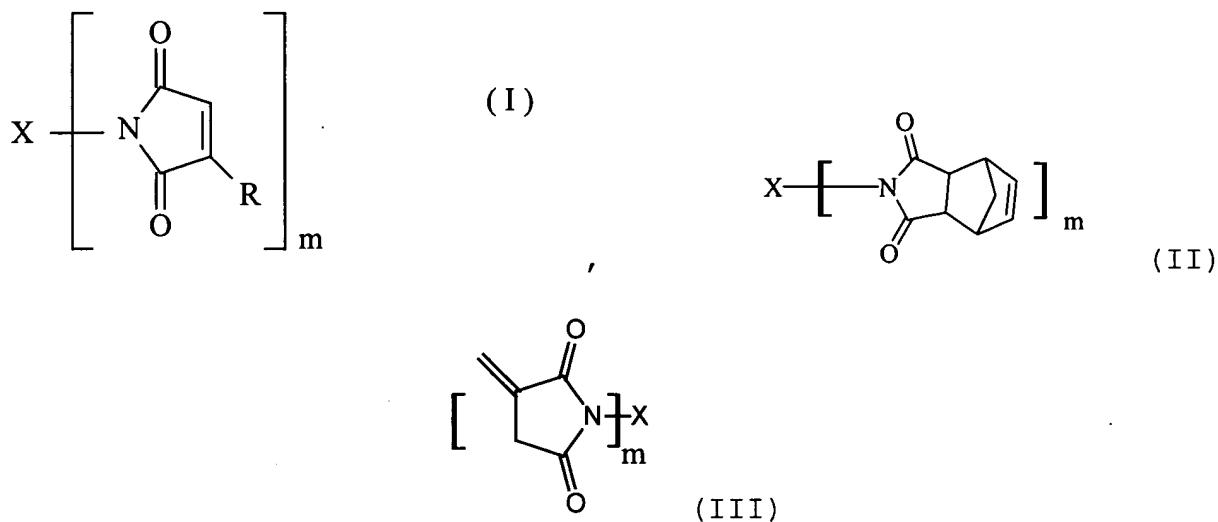
Claim 3. (Cancelled)

4. (Original) The composition of Claim 3, wherein the curative comprises a member selected from the group consisting of nitrogen containing compounds, anhydrides, organic acids and Lewis acids.

Claim 5. (Cancelled)

6. (Original) The composition of Claim 1, wherein the free radical polymerizable component comprises a maleimide-containing compound, an itaconimide-containing compound, or nadimide-containing compound.

7. (Original) The composition of Claim 6, wherein the maleimide-containing compound, itaconimide-containing compound or nadimide-containing compound comprises



wherein:

$m = 1-15$,

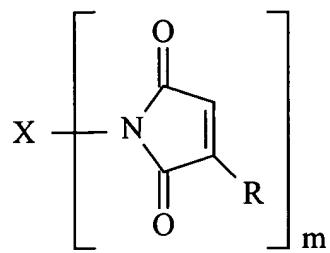
R is independently selected from hydrogen or lower alkyl, and

X is a monovalent moiety or a multivalent linking moiety

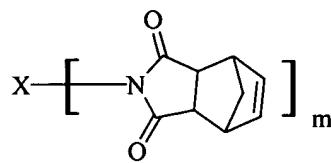
comprising organic or organosiloxane radicals, and combinations thereof.

8. (Original) The composition of Claim 1, wherein the maleimide-containing compound or nadimide-containing compound is in the solid state at room temperature.

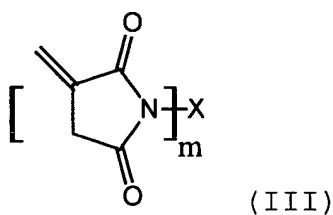
9. (Currently Amended) The composition of Claim 6, wherein the maleimide-containing compound, itaconimide-containing compound or nadimide-containing compound comprises:



(I)



(II)



(III)

wherein:

$m = 1-6$,

R is independently selected from hydrogen or lower alkyl, and
X comprises a monovalent moiety or a multivalent linking moiety
selected from

(A) straight or branched chain alkyl, alkylene, oxyalkyl,
oxyalkylene, alkenyl, alkenylene, oxyalkenyl, oxyalkenylene,
ester, reverse ester, polyester, amide, reverse amide, or
polyamide, optionally interrupted or substituted by one or more
heteroatoms, such as oxygen, nitrogen and/or sulfur, and
optionally functionalized with substituents selected from
hydroxy, alkoxy, carboxy, nitrile, cycloalkyl or cycloalkenyl;
where the number of carbon atoms in the linking moiety falls
between about 12 to about 500;

(B) siloxanes comprising:

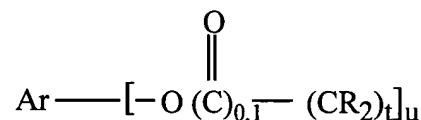
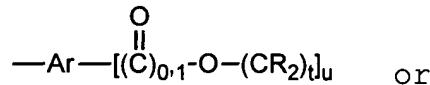
$-(CR_2)_m-[Si(R')_2-O]_{q'}-Si(R')_2-(CR_2)_n-$, $-(CR_2)_m-CR-C(O)O-(CR_2)_m-$
 $[Si(R')_2-O]_{q'}-Si(R')_2-(CR_2)_n-O(O)C-(CR_2)_n-$, or
 $-(CR_2)_m-CR-O(O)C-(CR_2)_m-[Si(R')_2-O]_{q'}-Si(R')_2-(CR_2)_n-C(O)O-(CR_2)_n-$
wherein each R is independently defined as above, and each R' is
independently selected from hydrogen, lower alkyl or aryl, m'
falls in the range of 1 up to 10, n' falls in the range of 1 up
to 10, and q' falls in the range of 1 up to 50;

(C) polyalkylene oxides comprising:

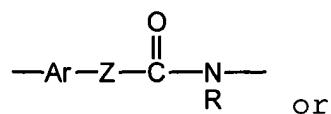
$-[(CR_2)_r-O-]_{q'}-(CR_2)_s-$

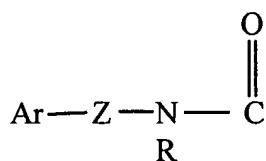
wherein each R is independently as defined above, r falls in the
range of 1 up to 10, s falls in the range of 1 up to 10, and q'
is as defined above;

(D) aromatic moieties comprising:



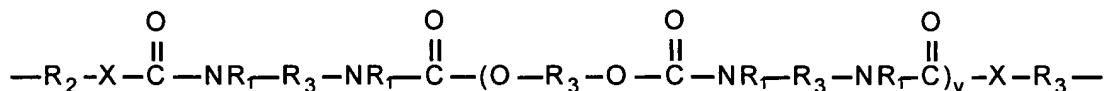
wherein each R is independently as defined above, t falls in the
range of 2 up to 10, u is 1, 2 or 3, and Ar is as defined above,
or





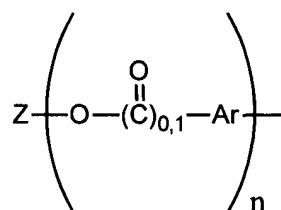
wherein Z is O or NR, where R is hydrogen or lower alkyl;

(E) urethanes comprising:

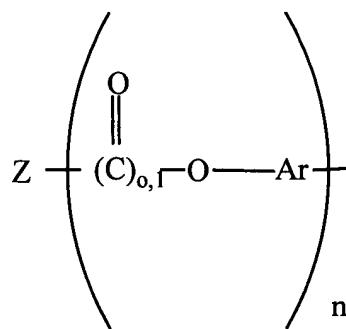


wherein each R₁ is independently hydrogen or lower alkyl; each R₂ independently is an alkyl, aryl, or arylalkyl group having 1 to 18 carbon atoms; R₃ is an alkyl or alkyloxy chain having up to about 100 atoms in the chain, which chain may contain aryl substituents; X is O, S, N, or P; and v is 0 to 50; and

(F) aromatic moieties comprising:



or



wherein each Ar is a monosubstituted, disubstituted or trisubstituted aromatic or heteroaromatic ring having in the

range of 3 up to about 10 carbon atoms; n is 1 up to about 50, and Z is selected from straight or branched chain alkyl, alkylene, oxyalkylene, alkenyl, alkenylene, oxyalkenylene, ester, or polyester, optionally containing substituents selected from hydroxy, alkoxy, carboxy, nitrile, cycloalkyl or cycloalkenyl; and

siloxanes comprising:

~~= (CR₂)_m - [Si(R')₂ - O]_{q'} - Si(R')₂ - (CR₂)_n - (CR₂)_m - CR - C(O)O - (CR₂)_n -~~
~~[Si(R')₂ - O]_{q'} - Si(R')₂ - (CR₂)_n - O(O)C - (CR₂)_m - or~~
~~= (CR₂)_m - CR - O(O)C - (CR₂)_n - [Si(R')₂ - O]_{q'} - Si(R')₂ - (CR₂)_n - C(O)O - (CR₂)_m -~~
wherein each R is independently defined as above, and each R' is independently selected from hydrogen, lower alkyl or aryl, m falls in the range of 1 up to 10, n' falls in the range of 1 up to 10, and q' falls in the range of 1 up to 50;

(G) polyalkylene oxides comprising:

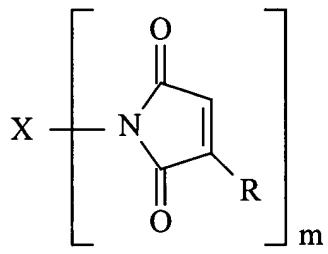
~~- [(CR₂)_r - O -]_{q'} - (CR₂)_s -~~

wherein each R is independently as defined above, r falls in the range of 1 up to 10, s falls in the range of 1 up to 10, and q' is as defined above; as well as combinations thereof.

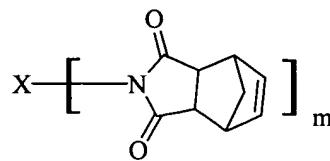
10. (Original) The composition of Claim 6, wherein the maleimide-containing compound, the itaconimide-containing compound, or the nadimide-containing compound comprises a maleimide functional group, itaconimide-containing functional

group or a nadimide functional group, respectively, attached to a monovalent radical or polyvalent radical having sufficient length and branching to render the maleimide-containing compound, the itaconimide-containing compound or the nadimide-containing compound, respectively, a liquid.

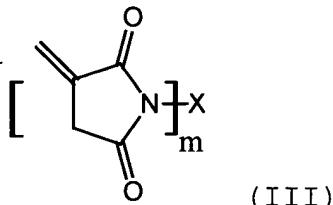
11. (Original) The composition of Claim 6, wherein the maleimide-containing compound, the itaconimide-containing compound or the nadimide-containing compound comprises:



(I)



(II)



(III)

wherein:

each R is independently hydrogen or lower alkyl,
-X- comprises a branched chain alkyl, alkylene or alkylene oxide species having sufficient length and branching to render the maleimide-containing compound, the itaconimide-containing compound or the nadimide-containing compound a liquid, and

m is 1, 2 or 3.

12. (Original) The composition of Claim 1, wherein the free radical polymerizable component comprises a member selected from the group consisting of (meth)acrylates, maleimides, itaconimides, nadimides, vinyl ethers, vinyl esters, styrene and derivatives thereof, poly(alkenylene)s, allyl amides, norbornenyls, thiolenes, acrylonitriles and combinations thereof.

Claims 13-15. (Cancelled)

16. (Original) A curable composition, comprising:

- (a) an anionically or cationically reactive component;
- (b) a free radical polymerizable component; and
- (c) a cross linking component, wherein the cross linking component comprises a compound having at least one functional group reactive with the anionically or cationically reactive component and at least one functional group reactive with the free radical polymerizable component.

17. (Currently Amended) The composition of ~~any one of~~ Claims 1 ~~14-16~~, wherein the at least one functional group reactive through an anionic or cationic mechanism with the epoxy or

episulfide resin component is a member selected from the group consisting of epoxies, episulfides, and combinations thereof.

18. (Currently Amended) The composition of ~~any one of~~ Claims 1 14-16, wherein the at least one functional group reactive through a free radical mechanism with the free radical polymerizable component is a member selected from the group consisting of (meth)acrylates, maleimides, itaconimides, nadimides, vinyl ethers, vinyl esters, styrenes, allyl amides, norbornenes and combinations thereof.

19. (Original) The composition of Claim 1, wherein the cross linking component comprises a compound having the structure:

A/C -- X -- FR,

wherein A/C represents at least one anionically or cationically reactive functional group, FR represents at least one free radically reactive functional group, and X represents a spacer.

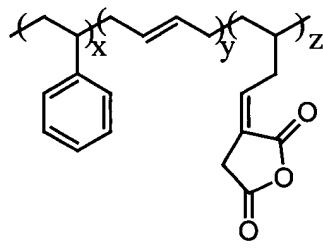
20. (Original) The composition of Claim 1, wherein A/C is E/ES, wherein E/ES represents at least one epoxy or episulfide.

Claim 21. (Cancelled)

22. (Currently Amended) A cross-linking compound comprising

A/C -- X -- FR,

wherein A/C represents at least one anionically or cationically reactive functional group or at least one epoxy or episulfide, FR represents at least one free radically reactive functional group, and X represents a spacer, provided that when A/C is not carboxylic acid, FR may be maleimide and/or X may be a five carbon straight chain alkyl group, when FR is not maleimide and X is not a five carbon straight chain alkyl group, A/C may be a carboxylic acid, when A/C is not maleic anhydride, FR is a polybutadiene or when FR is not a polybutadiene, A/C is maleic anhydride,



wherein the mole ratio of $x+y+z=1$, and combinations thereof.

Claims 23-27. (Cancelled)

28. (Original) A method for adhesively attaching a chip die to another chip die or a circuit board, said method comprising:

(a) applying the composition of Claim 1 to said chip

die,

(b) adjoining said chip die with said another chip die or said circuit board, respectively, to form an assembly wherein said chip die and said another chip die or said circuit board, respectively, are separated by the composition applied in step (a), and

(c) subjecting said assembly formed in step (b) to conditions suitable to cure said composition.

Claims 29-33. (Cancelled)

34. (Original) The composition of Claim 1, further comprising a filler.

Claims 35-38. (Cancelled)

39. (Original) An article of manufacture comprising a semiconductor chip attached to and in electrical interconnection with either another semiconductor chip or a carrier substrate, the semiconductor chip having a first surface and a second surface, with the first surface having electrical contacts arranged in a predetermined pattern thereon for providing electrical engagement with the another semiconductor chip or the

carrier substrate, respectively, and with the second surface having a cured composition of Claim 1 disposed on a layer or a portion thereof, so as to provide attachment between the semiconductor chip and the another semiconductor chip or the carrier substrate, respectively.